BELLCOMM, INC.
955 L'ENFANT PLAZA NORTH, S.W. WASHINGTON, D. C. 20024

SUBJECT: Trip Report: Eleventh Meeting of the AAP Mission Requirements Panel - Case 610

DATE: November 7, 1968

FROM: K. E. Martersteck

ABSTRACT

The eleventh meeting of the AAP Mission Requirements Panel was held at MSFC on October 24, 1968. Results of the major discussion points were the following:

1. Updating of MRP mission documents is scheduled for mid-December completion.

2. Although the MSFEB ordered a reexamination of experiment priorities, AAP planners will continue using the current baseline experiments list.

3. MSC/FOD presented data on the minimum interval between AAP missions. If two MOCR's are available to AAP, no schedule conflicts exist, although the schedule between AAP-3A and AAP-3 is extremely tight.

4. Two approaches to controlling the impact of spent orbiting stages were reviewed but each would present serious difficulties in implementation.

5. The initial report of a working group studying the possible use of AAP backup hardware to complete the core problem was given.

6. In reviewing the pending weight and performance changes, it appears that adequate margins would exist if 2-1/2 stages-to-orbit were baselined.

7. MSC outlined the activities of its Mission Design Information Group and discussed the data gathering, processing and disseminating which is necessary to effect mission planning.

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MEMORANDUM FOR FILE

The subject meeting was held at MSFC on October 24, 1968. The highlights and significant items discussed are summarized below. The section numbers refer to item numbers on the meeting agenda which is attached.

11.1 Review of Outstanding Action Items

11.1.1 and 11.1.2 - In general, an attempt is being made to bring all program documentation, especially Mission Requirements Documents and the Baseline Reference Mission Document, up to date and consistent with the current AAP baseline by the middle of December.

11.1.5 - Jack Waite, MSFC/I-SAA, reported on the action of the last MSFEB meeting at which the Board seriously questioned whether an optimum AAP experiments package had been developed. As a result alternative experiment loading approaches must be examined as well as the relative priority of the experiments themselves. Particular consideration will be given to evaluating the capability of the AAP-3A mission to accommodate experiments in the SM. The reopening of the experiment payload caused dismay among many MRP members. However, it was decided to continue present mission planning using the experiment list baselined at the last Weight and Performance Review.

11.1.6 and 11.1.7 - MSC flight operations personnel discussed some of the major constraints controlling the launch interval between successive flights. The actual launch time is constrained by the rendezvous window. However, most of this discussion centered on the time to turn around the ground systems. Among the considerations are: whether one or two Mission Operations Control Rooms (MOCR) in the Mission Control Center (MCC) will be available to AAP; whether the Real Time Computer Complex (RTCC) programs and Remote Site Data Processor (RSPD) programs need to be revised and checked out in their entirety; and how much overlap of tests, check-out and simulation of the following flight is possible.

The turn-around constraints were summarized as follows:

Interval between AAP-2 launch and AAP-1 launch:

Flight Control: 8 hours to confirm OWS systems status and gather tracking data

Rendezvous Opportunity: 30-1/2 hours

KSC Crews: about 1-1/2 hours

Interval between AAP-1 end and AAP-3A launch:

MCC:	Same RSDP	New RSDP
1 MOCR	30-45 days	55-70 days
2 MOCR's	0 days	21 days

KSC Pad Turn Around: 90 days launch to launch

Interval between AAP-3A end and AAP-3 launch:

MCC:	New RSDP assumed necessary
1 MOCR	70 days
2 MOCR's	28-57 days

KSC Pad Turn Around: 90 days launch to launch

Interval between AAP-3 launch and AAP-4 launch:

MCC/Flight Control:

Whenever OWS checkout is complete (crew estimates three days after AAP-3 docks)

KSC Crews: about 1-1/2 hours

Rendezvous Opportunity: to be set up 3-5 days after AAP-3 launch.

11.1.10 - This item is being worked by R. Lavender and R. Benson of MSFC/R-AERO. A related study had been performed for Apollo by LMSC several years ago. Referring to the LMSC study, Benson determined that to land the AAP-4 S-IVB within a 7000 km footprint (about an ocean width) from a 190 nm circular orbit would require a Δv = 80 m/sec or about 1000 lbs of solid rocket system.

An alternative approach considered contemplates the use of a controlled reentry by holding the vehicle "nose-on" until a selected time when tumbling would be initiated. Starting from 150 km the vehicle impact time could be varied over about a 4-3/4 hour interval. This scheme requires an attitude control system to be working until the tumble begins, which for the OWS means a life of over 500 days.

11.1.11 - This agenda item proved to be the feature event of the day! Major questions were raised at the LM-A and ATM PDR's regarding the backup or alternate missions for which the hardware must be designed. At its last meeting the MRP established a working group comprised of K. Turner, MLA, R. Lavender, MSFC/R-AERO, M. Jenkins, MSC/AAPO, to work this problem. A. Raffaelli, KSC/AAPO was added to the group at this meeting.

The group presented a long list of groundrules for their study, which is to be confined to the accomplishment of the core AAP program with the backup hardware where necessary; they will not consider any follow-on missions beyond the core program. They emphasized that they wanted to consider directives containing clear rationale for the use of AAP hardware, not hearsay comments. The groundrules which were shown provoked considerable discussion. Some groundrules were challenged outright as being invalid or too restrictive. The final disposition of the issue is that the group will consider the comments offered at the meeting, continue their work and report at the next meeting.

11.2 Performance and Weight Status Report

The performance and weight status was given by R. Marmann, MSFC/P&VE. After considering all the known pending changes including 2-1/2 stages-to-orbit, the projected mission margins are as follows:

AAP-1	AAP-2	AAP-3A	AAP-3	AAP-4
+2785	+2972	+2118	+2355	+3073

It was emphasized that although these are the healthiest margins ever seen for AAP flights, these figures represent the weight growth which must be allowed over the three years till launch.

11.4 Retention of Port 4 as an Alternate CM/SM Docking Port

A working group will be formed to study the impact of this situation and prepare a presentation for the next baseline review meeting. The Centers would like to appeal the decision to retain Port 4 as an alternate for CM/SM docking.

11.5 Review of LM-A and ATM PDR's for MRP Action Items

Several RID's requested that a critical timeline be generated. This will be handled by a special MRP working group.

11.6 Mission Planning Data to Support the BRM

C. Calvez, MSC/MPAD, gave a briefing on the Mission Design Information Group (MDIG) operating at MSC in MPAD. This group with TRW support gathers, processes and disseminates the myriad of detailed data required by the MSC mission planning personnel. It was stressed that dynamic or continuous updating of this data is essential. This implies close contact between hardware contractors and the MDIG. The whole issue of data exchange between MSC and MSFC remains to be worked out, especially in view of the new MSFC role in cluster systems integration responsibility. The MRP cochairmen will meet in the near future to begin negotiations on intercenter data exchange.

K. E. Martersteck

1025-KEM-dcs

Attachment

AGENDA

ELEVENTH MEETING OF THE MISSION REQUIREMENTS PANEL

MARSHALL SPACE FLIGHT CENTER

OCTOBER 24, 8:30 A.M.

BUILDING 4200, ROOM 513

11.1 Review of outstanding action items.

- 11.1.1 Publish the Mission Requirements Document for AAP-1/AAP-2, AAP-3A, and AAP-3/AAP-4, MRP AI 6.2.
- 11.1.2 Publish the Baseline Reference Mission Document for AAP-1/AAP-2, AAP-3A, and AAP-3/AAP-4, MRP AI 6.3.
- 11.1.3 Define criteria for checkout of the OWS prior to each CSM launch, MRP AI 7.3.
- 11.1.4 Define the Mission Requirements Panel Documentation Plan, MRP AI 8.1.
- 11.1.5 Establish the experiments compatibility for the AAP-1/AAP-2 Mission, MRP AI 8.4.
- 11.1.6 Determine the minimum and maximum time between each AAP launch, MRP AI 9.2.
- 11.1.7 Determine the minimum and maximum (if any) times that are feasible between each AAP launch, MRP AI 9.3.
- 11.1.8 Prepare Experiments Operations Requirements Section of MRP for AAP-3A and AAP-3/AAP-4, Experiment Sub-Panel AI 2.3.
- 11.1.9 Establish the earliest date that MSC can provide man-in-the-loop simulation of the WACS controller, MRP AI 10.1.
- 11.1.10 Establish the feasibility of controlled reentry of the spent S-IVB stage and the MDA/AM/OWS, MRP AI 10.2.
- 11.1.11 Formulate back-up program plans for utilization of Back-up MDA/AM/OWS and LM/ATM hardware.

11.2 Performance and Weight Status Report.

11.3 Review of changes to mission profiles resulting from the most recent Baseline meeting.

11.4 Retention of Port 4 as an alternate CSM docking port.

11.5 Review of LM-A and ATM PDR's for possible MRP action items.

11.6 Mission planning data to support the BRM.

11.7 Report from WACS PRR working requirement.

11.8 Sub-Panel reports.

11.9 New Items.

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